Conference Paper

Application of Luria Approach to Management of Autistic Spectrum Disorders

Katarzyna Markiewicz

Maria Curie Sklodowska University (POLAND, Lublin)

Abstract

Autistic persons show considerable difficulties in the ability of self-control including attention, motor reactions, resistance to distractions and delay of gratification, which are presently labelled as executive functions. The present paper describes dynamics of developmental changes in executive functions of 25 autistic children, patients of Specialised Clinic of Diagnosis and Rehabilitation in Lublin, Poland, during their early and late childhood. In accordance with Luria original approach the assessment of disorders observed was closely connected with therapeutic procedure. It made possible getting deeper insight into the difficulties encountered by the children and refinement of the course of therapy at the same time. Significant progressive changes in the development of executive functions were observed in the examined children. A significant correlation among an ability to control one's own reactions and cognitive functions, communication, and an ability to imitate others as well as general motor agility was stated. It allows the conclusion that autistic children are able to acquire an ability to change their former behaviours. They are, therefore, capable of understanding that a previous rule may be exchanged for the other, and they are also able to refrain from awaiting an immediate gratification.

Keywords: Autism, executive functions, diagnosis, therapy, Luria approach

Corresponding Author:
Katarzyna Markiewicz
k.markiew@wp.pl

Received: 25 July 2018
Accepted: 9 August 2018
Published: 1 November 2018

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the Fifth International Luria Memorial Congress Conference Committee.

1. Introduction

The autism spectrum *disorders* is a very complex syndrome comprising a configuration of various symptoms, which creates many diagnostic problems [1]. Due to difficulties in explaining its causes and astonishing variety of symptoms its nature remains a mystery despite enormous amount of publications. The complexity of that clinical syndrome, or rather syndromes, induces authors of the fifth edition if the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5™)* to propagate the term *Autism Spectrum Disorder (ASD)* [2]. Yet, despite growing number of publications the essence of autism remains an enigma. Most authors agree, however, that characteristic of autistic

persons, is inability to plan, organize, and perform complex tasks, which together with a marked cognitive rigidity, makes them reluctant to any changes including the diagnostic situations [4,5,]. In effect many diagnostic mistakes are observed [6, 7]. One of the solutions is combining the diagnostic procedure with therapy. It often enables refining or even changing initial diagnosis in the course of rehabilitation [4, 5]. It is worthy to note that in the process of developing particular skills of autistic children we should encourage them to perform actions of a similar recursive character. It makes possible develop their ability to inhibit a recently established reactions and to activate other trained reactions. It is desired, however, to change the content of the tasks. It makes possible developing their ability to inhibit a recently established reactions and to activate other trained reactions. Put differently it enables the child to acquire new skills, even though it takes a lot of time and effort [7, 9].

2. Methodology

2.1. Subjects

Twenty five autistic patients of the Specialized Clinic of Diagnosis and Rehabilitation in Lublin underwent regular developmental therapy. Adopting such an approach enabled us to delineate basic difficulties in the regulation of their behavior. It made possible developing a therapeutic program aimed at training the skills linked to the executive functions. The therapeutic progress was evaluated with a number of tasks constructed in order to assess executive function, the level of central coherence, and the theory of mind. Below the results of concerning the executive function will be discussed.

2.2. Procedure

In accordance with the Lurian approach the diagnosis of autistic children was performed alongside with a therapy. To be more exact, the initial diagnosis was either confirmed or verified as was the case with Damian, who was referred to the clinic with a diagnosis of deep autism and mental retardation. In the course of therapy it turned out that Damian's intellectual abilities were quite high [8]. The therapeutic procedure aiming at developing skills important for executive functioning consisted of three stages: creating, realizing and controlling an action schema. The first step is to change the child's predilection for stereotyped actions. We start with inhibition of undesired reactions and then train ability of waiting for the actions of another person.

The next step is acquiring a schema of self-control. The tasks utilized here are of simple repetitive character and gradually small alternations are introduced only after the child has mastered the basic schema. The details of that approach can be found in other papers [7–10].

Three tasks aimed at evaluation of therapeutic progress were utilized: (1) Inhibition was tested with a task that required sorting geometrical figures in accordance with a category given by the examiner. The categories of shape and color were changed in random order (EF1); (2) Impulse control was evaluated with a delayed reward task, which requires an ability to refrain from expecting immediate gratification (EF2); (3) Ability to shift the course of action was evaluated by an ability to select pictures following the principles given by the examiner in random order (EF3).

The first task required sorting geometrical figures in accordance with color, and then with shape. In order to accomplish that task a child has to be able to suppress interfering instruction that was given earlier. The second requires inhibition of the prepotent response, while the third one necessitates changing the course of action in accordance with the requirements of the arising situation. All those tasks are closely related to an ability of self-regulation, and demand overcoming cognitive rigidity characteristic of persons with ASD [8] The reliability index of all three tasks was .618 as measured with Cronbach's alpha.

3. Results

The progress of therapy was evaluated in three consecutive examinations, and, as exemplified in Table 1, progressive changes in abilities of the examined children could be observed in all three tasks.

After [9] with modifications (Bonferroni test)

The biggest improvement was observed in an ability to inhibit behaviors with the use of a system of rewards and punishments (F_2). The progress in the development of other two functions (F_1 and F_3) could also be noted but ran at a slower pace. It was bigger in switching the principle of action (F_3), and much smaller in developing an ability to be able to wait for the awaiting gratification (F_2). The significance of those changes was confirmed with Bonferroni method. It allows a conclusion that the children acquired the ability to plan and control their behavior, and to utilize their working memory while solving the problem they were facing. They also exhibited higher abilities to inhibit their reactions, control impulses, and to categorize. Significant relationships were also observed between the ability to inhibit the patients' reactions

Table 1: Significance of differences between mean scores in consecutive examinations.

Task	Examination	Examination	M (I-J) [*** p<.001]	Df
EF1	1	2	**-2.10*** **	.49
		3	**-3.54*** **	
	2	1	**2.10*** **	
		3	**-1.44*** **	
EF2	1	2	**-4.80*** **	1.09
		3	**-9.52*** **	
	2	1	**4.80*** **	
		3	**-4.72*** **	
EF3	1	2	**-3.51*** **	.461
		3	**-6.79*** **	
	2	1	**3.51*** **	
		3	**-3.28*** **	

and the developmental age measured with the Kendall's tau coefficient. On the other hand, the correlations between the severity of disorders and the improvement in the particular tasks proved to be insignificant. At the same time, some improvement in the ability to interact with significant others was noted. It is in agreement with reports stating that development of self-regulation in young healthy children reflects the level of their social competences and skill [11].

4. Discussion

The results presented in this paper confirm the assumption that it is possible to modify the behavior of autistic children, and to develop their ability of self-control. It is imperative, however, to use repetitive, rather simple schemas and sequential behaviors of actions that are easy to remember and do not require plasticity and active reasoning [7, 9, 10]. It should also be done step by step taking into account the developmental level of the child as well as his/her preferences and abilities. Accordingly, the tendency of and autistic child to count or collect things may be utilized for making inventories, and to develop an ability to categorize things [12]. It is a very important step in rehabilitation since the adjustment of the child behavior to a given situations is a prerequisite for developing the ability to understand the intentions of others. It points to the linkage of executive functions with Theory of Mind that was emphasized by a number of authors [3, 4, 12, 13]. Other rival theories aiming at explaining the essence of autistic disorders point to the Weak Central Coherence [14] or the lack of empathizing and systematizing [12, 15]. All those theories concentrate only on some of

the aspects of autistic disorders while trying to explain the lack of ability to establish social interactions [7, 16]. While a very important step in acquiring such abilities is inhibition of undesired reactions, and replacing them with more appropriate actions. It should be borne in mind that it is possible only in carefully structured situations.

Beside professional skills of a therapist of great importance for the effective rehabilitation is a close emotional bond between the child and the therapist. It was Vygotsky [17] who stressed that each child is ready to do much more for the person s/he trusts and feels safe with. Such a relationship is even more important in the case of autistic children. In fact, each child requires a highly individualized approach adopted to the level of his functioning. That is why the highly structured therapeutic programs do not bring the desired results.

5. Conclusions

It needs to be stressed that the improvement in executive functioning resulted in enhancement of social skills of the children. Naturally, the improvement does not mean that children reached the level typical of healthy children. All the same, they proved to be able to cooperate and to inhibit undesired behaviors. It is worth pointing out that the tasks utilized in the present study were highly structured and did not require active reasoning. Hence, the acquired abilities cannot be applied to more sophisticated social situations.

It was also shown that the carefully structured tests are of limited value in conducting assessment of all serious developmental disorders. The same is true of the structured therapeutic programs since each child requires individual approach that takes into account both severity of observed symptoms and his or her abilities.

References

[1] Lezak, M. D., Howieson, D. B. Bigler, E.D., & Tranel, D. (2012). *Neuropsychological Assessment*. New York: Oxford University Press.

[2] American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders.*(Fifth ed.). Arlington, VA: American Psychiatric Publishing. ISBN 978-0-89042-555-8.

[3] Russel, J. (1997). How executive disorders can bring about an inadequate "Theory of mind". In J. Russel (Ed.), *Autism and executive disorder* (pp. 256–304). New York: MIT Press.

[4] Lukito, S., Jones, C. R. G., Pickles, A., Baird, G., Happé, F., Charman, T., & Simonoff, E. (2017). Specificity of executive function and theory of mind performance in relation to attention-deficit/hyperactivity symptoms in autism spectrum disorders. *Molecular Autism*, 8(1). Retrieved from http://doi.org/10.1186/s13229-017-0177-1.

[5] Demetriou, E. A., Lampit, A., DS Quintana, D. S., Naismith, S. L., Song, Y. J. C., Pye, J. E., Hickie, I., & Guastella, A. J. (2017, April 25). Autism spectrum disorders: a meta-analysis of executive function. *Molecular Psychiatry*, 1–7. Retrieved from www.nature.com/mp.

[6] Markiewicz, K., & Pąchalska, M. (2007). Diagnosis of severe developmental disorders in children under three years of age. *Medical Science Monitor*, 13(2), CR89-99.

[7] Markiewicz, K. (2007). *Charakterystyka zmian w rozwoju umysłowym dzieci autystycznych* [Characteristics of changes in the mental development of autistic children] Lublin: UMCS Press.

[8] Markiewicz, K., & MacQueen, B. D. (2009). The autistic mind. *Medical Science Monitor,* 15(1), CS1-15.

[9] Markiewicz, K. (2009). Disorder of executive function in autistic children. *The New Educational Review*, 17(1), 361-366.

[10] Markiewicz, K., Kaczmarek, B. L. J., Grochmal-Bach, B., Olszewski, H, & Guzińska, K.(2009). Rehabilitation of executive functioning in an autistic child: A case study. *Acta Neuropsychologica,* 7(1), 45-58.

[11] Kochanska, G., Coy, K. C., & Murray, K. T. (2001), The development of self-regulation in the first four years of life. *Child Development*, 72, 1091-1111. doi:10.1111/1467-8624.00336.

[12] Baron-Cohen, S. (2008 November 29). *The empathizing -systematizing (E-S) theory of autism.* Paper presented at International Conference: Rain Man is Among Us. Cracow, Poland.

[13] Joseph, R. M., & Tager–Flusberg, H. (2004). The relationship of theory of mind and executive functions to symptom type and severity in children with autism. *Development and Psychopathology*, *16*(1), 137–155. Retrieved from http://doi.org/10.1017/S095457940404444X

[14] Frith, U. (2003). *Autism: Explaining the enigma*. (2nd ed.). Malden: Blackwell Publishing.

[15] Baron-Cohen, S. (2003). Autism, hypersystemizing, and truth. *Quarterly Journal of Experimental Psychology*, 61(1), 64-75. Retrieved from https://doi.org/10.1080/17470210701508749.

[16] Martin, I., & McDonald, S. (2003). Weak coherence, no theory of mind or executive disfunction? *Brain and Language, 85, 89-99.*

[17] Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press